

Box Patent Application  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231

PATENT  
Docket No. 1562-PAT

NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of

Inventor(s): MICHAEL J. POWERS

WARNING: Patent must be applied for in the name(s) of the actual inventor(s) .37CFR 1.41 and 1.53(b).

For (title): A HAND HELD DEVICE FOR REDUCING THE DISCOMFORT ASSOCIATED  
WITH THE ADJUSTING OF ORTHODONTIC APPLIANCES

1. Type of Application

This new application is for a(n) (check one applicable item below):

- ☒ Original  
☐ Design  
☐ Plant

WARNING: Do not use this transmittal for a completion in the U.S. of an International Application under 35 U.S.C. 371(c)(4) unless the International Application is being filed as a divisional, continuation or continuation-in-part application.

NOTE: If one of the following 3 items apply, then complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF A PRIOR U.S. APPLICATION CLAIMED and a NOTIFICATION IN PARENT APPLICATION OF THE FILING OF THIS CONTINUATION APPLICATION.

- ☐ Divisional  
☐ Continuation  
☐ Continuation-in-part (CIP)

CERTIFICATION UNDER 37 CFR 1.10

I hereby certify that this New Application Transmittal and the documents referred to as enclosed therein are being deposited with the United States Postal Service on this date \_\_\_\_\_ in an envelope as "Express Mail Post Office to Addressee" Mailing Label Number \_\_\_\_\_ addressed to the: Commissioner of Patents and Trademarks, Washington, D.C. 20231

(Type or print name of person mailing paper)

(Signature of person mailing paper)

NOTE: Each paper or fee referred to as enclosed herein has the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 CFR 1.10(b).

**2. Benefit of Prior U.S. Application(s)(35 USC 120)**

NOTE: If the new application being transmitted is a divisional, continuation or a continuation-in-part of a parent case, or where the parent case is an International Application which designated the U.S., then check the following item and complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

☐ The new application being transmitted claims the benefit of prior U.S. applications(s) and enclosed are ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

**3. Papers Enclosed Which Are Required For Filing Date Under 37 CFR 1.53(b) (Regular) or 37 CFR 1.53 (Design) Application**

9 Pages of specification  
2 Pages of claims  
1 Pages of Abstract  
2 Sheets of drawing

☒ formal

☐ informal

**WARNING:**

DO NOT submit original drawings. A high quality copy of the drawings should be supplied when filing a patent application. The drawings that are submitted to the Office must be on strong, white, smooth, and non-shiny paper and meet the standards according to § 1.84. If corrections to the drawings are necessary, they should be made to the original drawing and a high-quality copy of the corrected original drawing then submitted to the Office. **Only one copy is required or desired.** Comments on proposed new 37 CFR 1.84. Notice of March 9, 1988 (1990 O.G. 57-62).

NOTE: "Identifying indicia such as the serial number, group and unit, title of the invention, attorney's docket number, inventor's name, number of sheets, etc., not to exceed 2 3/4 inches (7.0 cm.) in width may be placed in a centered location between the side edges within three fourths inch (19.1 mm.) of the top edge. Either this marking technique on the front of the drawing or the placement, although not preferred, of this information and the title of the invention on the back of the drawings is acceptable." Proposed 37 CFR 1.84(1). Notice of March 9, 1988 (1090 O.G. 57-62).

**4. Additional papers enclosed**

- ☐ Preliminary Amendment
- ☐ Information Disclosure Statement (37 CFR 1.98)
- ☐ Form PTO-1449
- ☐ Citations
- ☐ Declaration of Biological Deposit
- ☐ Submission of "Sequence Listing," computer readable copy and/or amendment pertaining thereto for biotechnology invention containing nucleotide and/or amino acid sequence
- ☐ Authorization of Attorney(s) to Accept and Follow Instructions from Representative
- ☐ Special Comments
- ☐ Other

5. Declaration or oath

- ☒ Enclosed  
executed by (check all applicable boxes)
- ☒ inventor(s).
- ☐ legal representative of inventor(s). 37 CFR 1.42  
or 1.43
- ☐ joint inventor or person showing a proprietary  
interest on behalf of inventor who refused to sign  
or cannot be reached.
- ☐ this is the petition required by 37 CFR 1.47 and the  
statement required by 37 CFR 1.47 is also attached. See  
item 12 below for fee.
- ☐ Not enclosed.

WARNING: Where the filing is a completion in the U.S. of an International Application but  
where a declaration is not available or where the completion of the U.S.  
application contains subject matter in addition to the International Application,  
the application may be treated as a continuation or continuation-in-part, as the  
case may be, utilizing ADDED PAGE FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT  
OF PRIOR U.S. APPLICATION CLAIMED.

- ☐ Application is made by a person authorized under 37 CFR  
1.41(c) on behalf of all the above named inventor(s). (The  
declaration or oath, along with the surcharge required by 37 CFR 1.16(e)  
can be filed subsequently).

NOTE: It is important that all the correct inventor(s) are named for filing under 37 CFR  
1.41(c) and 1.53(b).

- ☐ Showing that the filing is authorized. (Not required  
unless called into question. 37 CFR 1.41(d).)

6. Inventorship Statement

WARNING: If the named inventors are each not the inventors of all the claims, an  
explanation, including the owner-ship of the various claims at the time the last  
claimed invention was made, should be submitted.

The inventorship for all the claims in this application are:

- ☒ The same  
or
- ☐ Are not the same. An explanation, including the ownership of  
the various claims at the time the last claimed invention was  
made,
- ☐ is submitted
- ☐ will be submitted.

## 7. Language

NOTE: An application including a signed oath or declaration may be filed in a language other than English. A verified English translation of the non-English language application and the processing fee of \$130.00 required by 37 CFR 1.17(k) is required to be filed with the application or within such time as may be set by the Office. 37CFR 1.52(d).

NOTE: A non-English oath or declaration in the form provided or approved by the PTO need not be translated. 37 CFR 1.69(b).

☒ English

☐ non-English

☐ the attached translation is a verified translation. 37 CFR 1.52(d).

## 8. Assignment

☐ An assignment of the invention to \_\_\_\_\_

☐ is attached. A separat ☐ "COVER SHEET FOR ASSIGNMENT

(DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.

☐ will follow

NOTE: "If an assignment is submitted with a new application, send two separate letters-one for the supplication and one for the assignment." Notice of May 4, 1990 (1114 O.G. 77-78).

## 9. Certified Copy

Certified copy(ies) of application(s)

(country)	(appln. no.)	(filed)
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(country)	(appln. no.)	(filed)
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(country)	(appln. no.)	(filed)
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from which priority is claimed

☐ is(are) attached.

☐ will follow.

NOTE: The<sup>1</sup> foreign application forming the basis for the claim for priority **must** be referred to in the **oath** or **declaration**. 37 CFR 1.55(a) and 1.63.

NOTE: This item is for any foreign priority for which the application being filed directly relates. If any parent U.S. application or International Application from which this application claims benefit under 35 U.S.C. 120 is itself entitled to priority from a prior foreign application, then complete item 18 on the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

10. Fee Calculation (37 CFR 1.16)

A. ☒ Regular application

CLAIMS AS FILED			
Number filed	Number Extra	Rate	Basic Fee \$790.00
Total Claims	9 -20= 0	x \$ 22.00	-0-
Independent Claims	1 -3= 0	x \$ 82.00	-0-
Multiple Dependent Claim(s), if any	0	\$270.00	-0-

- ☐ Amendment canceling extra claims enclosed
- ☐ Amendment deleting multiple dependencies enclosed
- ☐ Fee for extra claims is not being paid at this time

NOTE: If the fees for extra claims are not paid on filing, they must be paid, or the claims canceled by amendment, prior to the expiration of the time period set for response by the Patent and Trademark Office in any notice of fee deficiency. 37 CFR 1.16(d).

Filing Fee Calculation \$ 790.00

B. ☐ Design application  
(\$330.00--37 CFR 1.16(f))

Filing Fee Calculation \$ \_\_\_\_\_

C. ☐ Plant application  
(\$530.00--37 CFR 1.16(g))

Filing fee Calculation \$ \_\_\_\_\_

11. Small Entity Statement(s)

☒ Verified Statement(s) that this is a filing by a small entity under 37 CFR 1.9 and 1.27 is(are) attached.

Filing Fee Calculation (50% of A or B above) \$ 395.00

NOTE: Any excess of the full fee paid will be refunded if a verified statement and a refund request are filed within 2 months of the date of timely payment of a full fee. 37 CFR 1.28(a).

12. Request for International-Type Search (37 CFR 1.104(d) (complete, if applicable))

☐ Please prepare an international-type search report for this application at the time when national examination on the merits takes place.

13. Fee Payment Being Made At This Time

☐ Not Enclosed

☐ No filing fee is to be paid at this time. (This and the surcharge required by 37 CFR 1.16(e) can be paid subsequently.)

☒ Enclosed

☒ basic filing fee \$ 395.00

☒ recording assignment \$ \_\_\_\_\_  
(\$40.00; 37 CFR 1.21(h)(1))

☐ petition fee for filing by other than the inventors or person on behalf of the inventor where inventor refused to sign or cannot be reached (\$130.00; 37 CFR 1.47 and 1.17(h)) \$ \_\_\_\_\_

☐ for processing an application with a specification in a non-English language. (\$130.00; 37 CFR 1.52(d) and 1.17(k)) \$ \_\_\_\_\_

☐ processing and retention fee \$ \_\_\_\_\_  
\$130.00; 37 CFR 1.53(d) and 1.21(l))

☐ fee for international-type search report (\$40.00; 37 CFR 1.21(e)) \$ \_\_\_\_\_

NOTE: 37 CFR 1.21(l) establishes a fee for processing and retaining any application which is abandoned for failing to complete the application pursuant to 37 CFR 1.53(d) and this, as well as the changes to 37 CFR 1.53 and 1.78, indicate that in order to obtain the benefit of a prior U.S. application, either the basic filing fee must be paid or the processing and retention fee of \$ 1.21(l) must be paid within 1 year from notification under \$ 53(d).

Total fees enclosed \$ 395.00

14. Method of Payment of Fees

☒ Check in the amount of \$ 395.00

☐ Charge Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_  
A duplicate of this transmittal is attached.

NOTE: Fees should be itemized in such a manner that it is clear for which purpose the fees are paid. 37CFR 1.22(b).

## 15. Authorization to Charge Additional Fees

WARNING: If no fees are to be paid on filing, the following items should **not** be completed.

WARNING: Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges, if extra claim charges are authorized.

☒ The Commissioner is hereby authorized to charge the following additional fees by this paper and during the entire pendency of this application to Account No. 07-1338 .

☒ 37 CFR 1.16(a), (f) or (g) (filing fees)

☒ 37 CFR 1.16 (b), (c) and (d) (presentation of extra claims)

NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims canceled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 CFR 1.16(d)), it might be best not to authorize the PTO to charge additional claim fees, except possibly when dealing with amendments after final action.

☒ 37 CFR 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date later than the filing date of the application)

☒ 37 CFR 1.17 (application processing fees)

WARNING: While 37 CFR 1.17(a), (b), (c) and (d) deal with extension of time under § 1.136(a), this authorization should be made only with the knowledge that: "Submission of the appropriate extension fee under 37 CFR 1.136(a) is to no avail unless a request or petition for extension is filed." (Emphasis added). Notice of November 5, 1985 (1060 O.G.27)

☐ 37 CFR 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 CFR 1.311(b)).

NOTE: Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 CFR 1.31(b).

NOTE: 37 CFR 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application...prior to paying, or at the time of paying...issue fee". From the wording of 37 CFR 1.28(b):(a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

## 16. Instructions As To Overpayment

☒ credit Account No. 07-1338

☐ refund

Reg. No. 26,548

07/10/98

SIGNATURE OF ATTORNEY

Tel. No. (619) 292-0901

Fax No. (619) 292-0905

FRANK D. GILLIAM

4565 Ruffner Street, Ste. 200  
San Diego, California 92111

☐ **Incorporation by reference of added pages**

Check the following item if the application in this transmittal claims the benefit of prior U.S. application(s) (including an international application entering the U.S. stage as a continuation, divisional or C-I-P application) and complete and attach the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED

☐ Plus Added Pages For New Application Transmittal Where Benefit Of Prior U.S. Application(s) Claimed  
Number of pages added\_\_\_\_\_

☐ Plus Added Pages For Papers Referred To In Item 4 Above  
Number of pages added\_\_\_\_\_

☐ Plus "Assignment Cover Letter Accompanying New Application"  
Number of pages added\_\_\_\_\_

☒ **Statement Where No Further Pages Added**

If no further pages form a part of this Transmittal, then end this Transmittal with this page and check the following item

☒ This transmittal ends with this page.

236422 F 260 236422 F 260



Applicant or Patentee: MICHAEL J. POWERS Attorney's  
Serial or Patent No.: \_\_\_\_\_ Docket No.: 1562-PAT  
Filed or Issued: \_\_\_\_\_  
For: A HAND HELD DEVICE FOR REDUCING THE DISCOMFORT ASSOCIATED WITH THE  
ADJUSTING OF ORTHODONTIC APPLIANCES

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY  
STATUS (37 CFR 1.9(f) AND 1.27(c) - INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled A HAND HELD DEVICE FOR REDUCING THE DISCOMFORT ASSOCIATED WITH THE ADJUSTING OF ORTHODONTIC APPLIANCES described in

[XX] the specification filed herewith  
[ ] application serial no. \_\_\_\_\_, filed \_\_\_\_\_  
[ ] patent no. \_\_\_\_\_, issued \_\_\_\_\_

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 109(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

[XX] no such person, concern, or organization  
[ ] persons, concerns or organizations listed below\*

NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGANIZATION

FULL NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGANIZATION

FULL NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b)).



INVENTOR

Michael J. Powers  
4711 Gabriel Way  
La Mesa, California 91941

The invention is a citizen of the United States of America

TITLE OF THE INVENTION

A hand held device for reducing the discomfort associated  
with the adjusting of orthodontic appliances

## TITLE

A hand held device for reducing the discomfort associated  
with the adjusting of orthodontic appliances

5

## BACKGROUND OF THE INVENTION

The invention relates to hand held apparatus for utilizing a  
vibrating interdental mouthpiece to eliminate the discomfort caused  
by the adjustment of the dental patient's orthodontic appliances.

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There are several patents directed to various elaborate  
professional apparatus utilized by Dentists in their offices for  
multiple purpose one of which is reducing discomfort for the  
orthodontic patient.

15

Patents No. 4,123,844; 4,229,165; 4,244,688; 4,348,177;  
4,348,178 and 4,382,780 all by inventor Craven H. Kurz teach  
various apparatus and methods for the purpose of decreasing overall  
treatment time and reducing bone and root loss in a pain free  
environment. These devices appear to be complex professional dental  
equipment for use under the supervision of a dental professional in  
a dental office atmosphere.

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There has not been a inexpensive portable unit that can be  
used by the patient in a non-dental office environment which has a  
disposable interdental mouthpiece that can easily be replaced if it  
becomes damaged or contaminated.

## SUMMARY OF THE INVENTION

5 The device of the invention comprises in one embodiment a hand held plastic housing containing a battery operated motor which operates at high revolutions, a weight being attached to the motor shaft in an off center position which when the motor is operated cause the entire housing and contents therein to vibrate at a very fast rate, a battery and a switch for selectively connecting the battery to the motor for operation thereof. A interdental mouthpiece in the general shape of a dental arch is attached to the end of the housing remote from the battery and switch. The interdental mouthpiece is attached in a position normal to the housing length by means of a loop at the end opposite to the end to be held in the mouth of the patient. The loop's interior diameter is the same diameter as that of the attached body of the housing which provides a snug selectively removable friction attachment to the housing. The interdental mouthpiece can be easily removed and a second interdental mouthpiece can be readily attached on the same apparatus body. When replacement is required because of damage or contamination any number of interdental mouthpieces can be utilized separately on the same housing.

20 In a second embodiment, the housing is positioned parallel to the interdental mouthpiece, the interdental mouthpiece is inserted within a slot in the side of a connector positioned between and

connecting an adjacent pair of housings. And is locked thereon by means of a protrusion in the housing and a concave dimple in the interdental mouthpiece for mating with the protrusion. The interdental mouthpieces is constructed to have a tight or snug fit into the slot. Different interdental mouthpieces can be forced into the slot and forced out, but will not accidentally become detached from the housing during operation of the device. This second embodiment has a bifurcated housing with the motor and concentric weight in one bifurcation and the battery in the second bifurcated portion with the connector therebetween containing the slot for the interdental mouthpiece.

The interdental mouthpiece is formed in the general shape of a dental arch has a thickness of from two to five millimeters and a maximum width in the range of ten to fifteen millimeters.

The interdental mouthpiece is constructed of soft flexible material such as plastic, rubber, dental acrylics, silicon based products or the like having the properties of being firm, dense enough to transmit the vibrations from the housing and flexible enough to adapt to the misaligned teeth found in orthodontic patients.

The housing generally consists of two or more removable sections constructed from any convenient material and such as plastic, metal or the like suitable for the purpose intended. The

power supply battery can be rechargeable or the throwaway type commonly available.

The principle object of this invention is to provide a patient fitted with orthodontic appliances a personal apparatus to reduce the discomfort caused by the adjustments of the appliance.

Another object of this invention is to provide the patient with a hand held vibrating device equipped with a interdental mouthpiece that vibrates the teeth of the patient when gripped between that patient's teeth to ease or eliminate discomfort caused by the adjustment of the orthodontic appliance worn by that patient.

Another object of this invention is to provide a vibrating device for easing the discomfort associated with the adjustment of orthodontic appliances that can be used by the dental patient independent of professional dental assistance.

Yet another object of this invention is to provide each dental patient wearing orthodontic appliances a simple and inexpensive device for eliminating discomfort from the appliances.

These and other objects, features and advantages of the present invention will become apparent from the following description when take with the accompanying drawing Figures.

#### BRIEF DESCRIPTION OF THE DRAWING FIGURES

Figure 1 depicts one embodiment of the device of the invention

positioned for use in the mouth of a patient wearing an orthodontic apparatus;

Figure 2 is a perspective showing of the first embodiment with the interdental mouthpiece separated from the vibration body portion;

Figure 3 depicts a top view of the device of Figure 2;

Figure 4 is a side view of the device of Figure 2;

Figure 5 is a partial cutaway showing of the device of Figure 2;

Figure 6 depicts a second embodiment of the device of the invention with the interdental mouthpiece portion shown separated therefrom;

Figure 7 is a partial cutaway side view showing of the device of Figure; and

Figure 8 is a top plan view of the device of Figure 6 with the separated interdental mouthpiece shown inserted into the device.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

Referring now to Figures 1-5. Figure 1 is a showing of the vibrating device 10 of the invention positioned for use with the interdental mouthpiece 12 inserted into the mouth of the patient wearing an orthodontic appliance 14 for straightening of the patient's teeth or the like.

Referring now to drawing Figures 2-5, the device 10 comprises



a two part body portion 16 and 18. Body portion 16 houses a battery power supply 20 and a power connecting means 22.

The upper body portion 18 houses a motor 24 held in position by an intermediate plate 25 which grips the side walls of the cavity 27 housing the motor. The motor has a rotating shaft 26 to which a weight 28 is attached. The weight is connected to the shaft in an off center position so that when it rotates the entire device will vibrate. The top 30 of body portion 18 has a cap 32 which seals the device from the elements and provides is substantially water proof. The bottom portion 16 is removable for battery change and a slight turning of body portion 16 clockwise relative to body portion 18 causes power connecting means 22 to complete the electrical circuit from the battery to the motor causing the motor to rotate. Counterclockwise rotation disconnects the battery from the motor causing the motor to cease operation.

For the purpose of sealing the two body portions together an "O" ring, not shown, can be placed between the two body portions for sealing when assembled together.

The teeth gripping interdental mouthpiece 12 constructed from a resilient material discussed above that is suitable for the purpose intended has an aperture 34 at one end for a removable friction connection to the body portion 18 by a force fit over the end of the body portion.

The interdental mouthpiece 12 has a thickness in the range of two to five millimeters and has a generally "Y" shaped plan view shaped as a dental arch with a width in the range of ten to fifteen millimeters at its distal end largest width dimension.

5            Figures 6-8 depict a second embodiment 36 of the invention.

Referring now specifically to drawing Figure 6, device 36 of the second embodiment includes two interconnected body portions 38 and 40 which provide the same purpose as the two body portions 16 and 18 discussed above.

10            Intermediate the two body portions 38, 40 at the body portions interconnector 42 having a slot 44 for receiving a interdental mouthpiece 46. The interdental mouthpiece 46 is held in place by a close fiction fit in the slot 44. A dimple 48 on either side or on both sides of the interdental mouthpiece surface registers with a protrusion 50 in the slot 44 that locks the interdental mouthpiece in slot 44. The interdental mouthpiece is removable and reinsertable by a slight force to free the connection between dimple 48 and protrusion 50.

15            Referring now specifically to drawing Figure 7, the motor 24, motor shaft 26, weight 28, power supply and power connection 22 are the same as herein before described. The only significant difference between the vibrating operation of the two embodiment is that the embodiment 10 differs from embodiment 36 is that in the

embodiment 10 the motor assembly is normal to the interdental mouthpiece 12 and in the embodiment 36 the motor assembly is parallel to the interdental mouthpiece 46. The resulting discomfort reduction appears to be the same in either embodiment. Figure 8 depicts a bottom plan viewing showing of the second embodiment 36.

In operation the vibrating electric motor is activated and the patient inserts the interdental mouthpiece between their teeth and begin a clinching, releasing and sliding exercise in an attempt to engage as many teeth as possible in the transmitted vibrations.

Although it is not completely understood why there is tooth discomfort following orthodontic adjustment, it is known that the onset of discomfort is within two to four hours with a maximum discomfort level found between one and three days with a return to normal after five to seven days.

Most of the orthodontic literature concludes that pain associated with the teeth and surrounding periodontal structures is caused by the interruption of blood supply before the onset of pain. For this reason, the apparatus should be utilized as soon as possible following the orthodontic adjustment (for a period of 15 to 40 minutes). This is usually a sufficient application to eliminate the pain response in most patients. However, orthodontic adjustment of a higher force and/or adjustments to more sensitive

patients can benefit from additional applications of the apparatus, such as, 10 to 15 minutes before dinner, bed, upon arising and any other time a feeling of tightness occurs.

It is believed that the high frequency vibrations transmitted to the teeth and surrounding periodontal structures via the interdental mouthpiece reestablishes a blood supply sufficient enough to eliminate the ischemic response and therefore the pain associated with post orthodontic adjustments.

The intended mouthpiece from each embodiment is easily removed which enables damaged or contaminated mouthpiece to be replaced.

It will be appreciated that while particular embodiments of the invention have been shown and described, modifications may be made. It is intended in the claims to cover the modifications which come within the sprit and scope of the invention.

What is claimed is:

1. A device for reducing the discomfort in the mouth of a human patient, said discomfort being created by the adjustment of an orthodontic appliance fitted to the patient's teeth comprising:

a housing, said housing containing a motor driven vibrating unit and a self contained power supply for operating said motor;

activating means for interconnecting said motor driven vibrating unit to said self contained power supply for operation thereof; and

an elongated solid flat resilient interdental mouthpiece having substantially the shape of a dental arch and a thickness in the range of two to five millimeters removably connected to said housing, the distal end of said interdental mouthpiece designed for practical insertion into the mouth for gripping between the patient's teeth, when said vibrating unit is activated by said activating means said interdental mouthpiece vibrates said patient's teeth increasing blood flow and eliminating the ischemia response thereby reducing said discomfort.

2. The invention as defined in claim 1 wherein said interdental mouthpiece is positioned normal to said housing when connected thereto.

3. The invention as defined in claim 1 wherein said interdental mouthpiece is positioned on a plane parallel with said housing when connected thereto.

4. The invention as defined in claim 1 wherein said interdental mouthpiece is removably attached to said housing on the external surface adjacent to a distal end thereof.

5 5. The invention as defined in claim 4 wherein the housing attachment end of said interdental mouthpiece has an aperture therethrough for receiving a distal end of said housing therein and frictionally maintaining the attachment of said interdental mouthpiece to said housing.

10 6. The invention as defined in claim 1 wherein said interdental mouthpiece is removably received within a slot in said housing.

15 7. The invention as defined in claim 6 additionally comprising a lock means for removably attaching said interdental mouthpiece to said housing within said slot in said housing.

20 8. The invention as defined in claim 1 wherein said interdental mouthpiece has a width in the range of 10 to 15 millimeters at its longest dimension.

9. The invention as defined in claim 1 wherein said interdental mouthpiece is constructed from a soft plastic material flexible enough to adapt to the teeth of the patient and transfer sufficient vibrations from the motor driven vibrating unit to the teeth of that patient.

## ABSTRACT OF THE DISCLOSURE

A dental patient hand held vibrating device having a interdental mouthpiece portion for insertion into the mouth for gripping between the teeth of the dental patient encountering discomfort resulting from the adjustment of their orthodontic appliances. The hand held device comprises a housing containing a battery and a switch for selectively operating a motor with an off center weight attached to the motor rotating shaft for creating a high frequency vibration that vibrates the entire device. The vibration is transferred from the body of the device to the interdental mouthpiece held between the teeth of the patient. The vibrating interdental mouthpiece reestablishes an adequate blood supply to the teeth and surrounding periodontal structures so as to substantially eliminate the discomfort encountered by a patient that has had their orthodontic appliance adjusted.

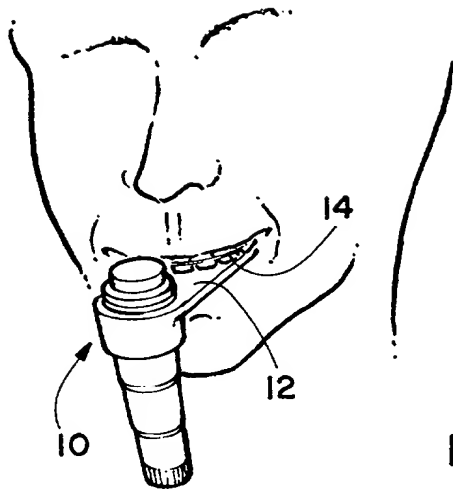


FIGURE 1

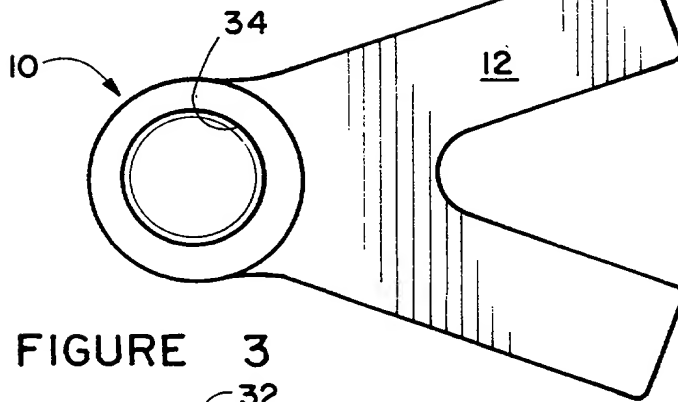


FIGURE 3

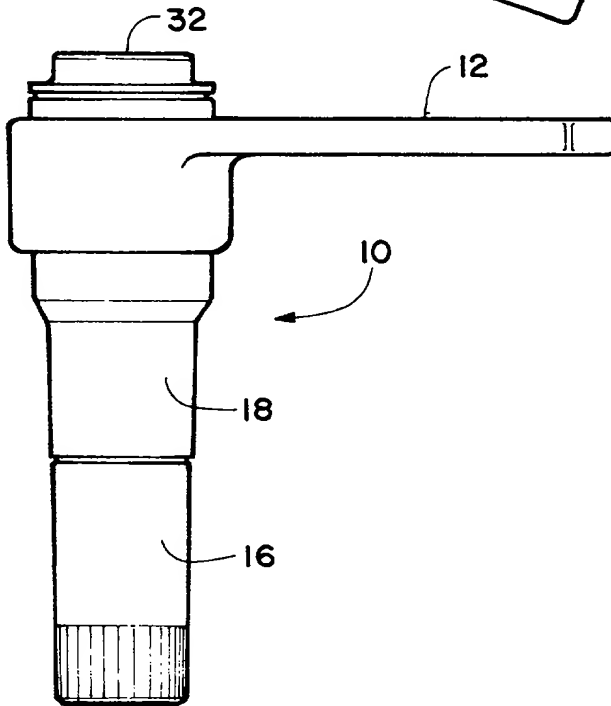


FIGURE 4

FIGURE 2

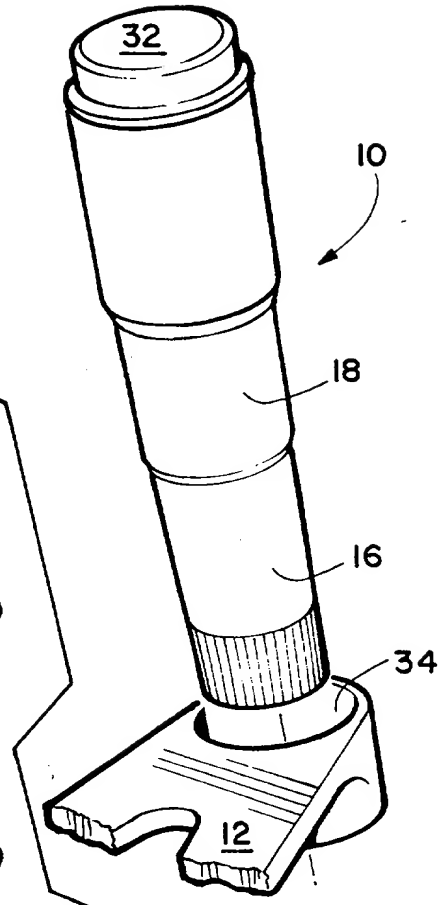
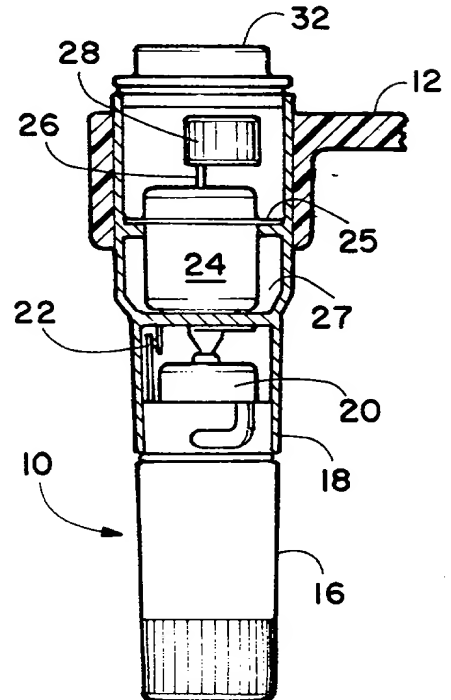


FIGURE 5





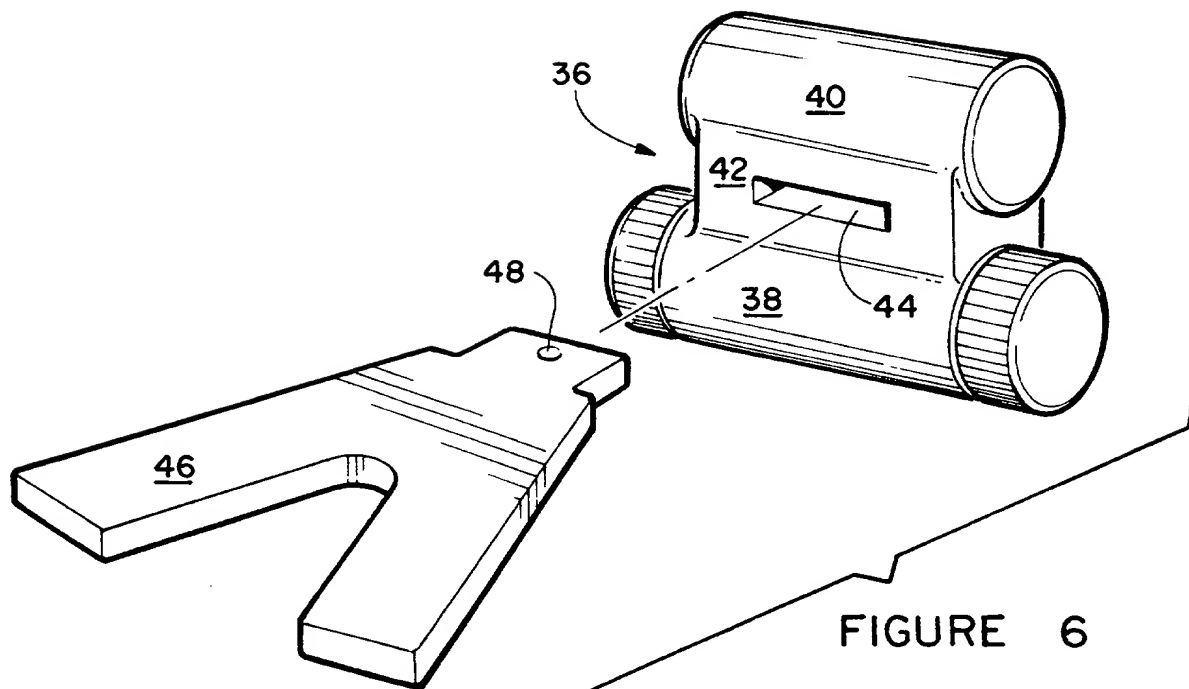


FIGURE 6

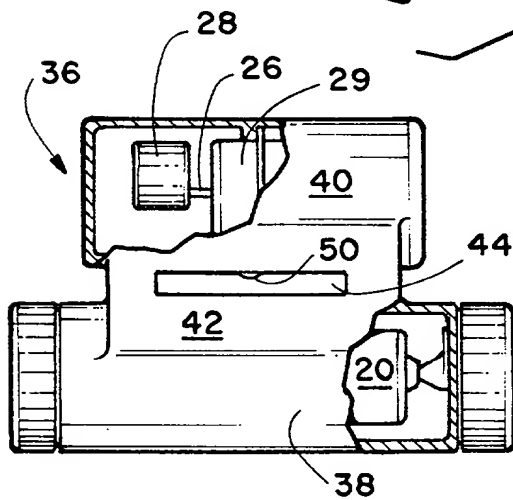


FIGURE 7

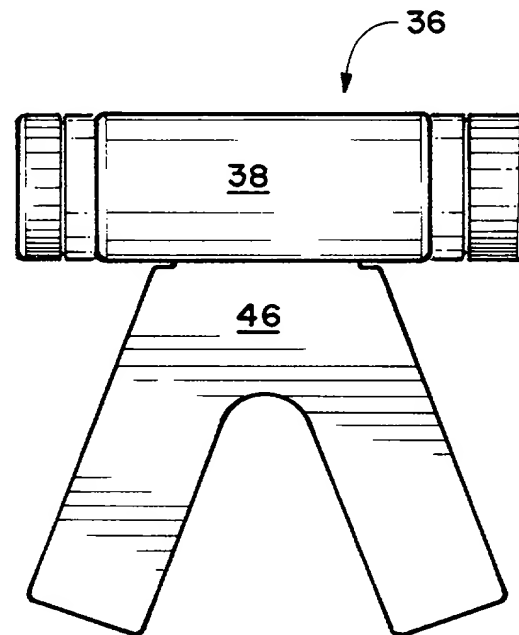


FIGURE 8

Attorney's Docket No. 1562-PAT**COMBINED DECLARATION AND POWER OF ATTORNEY**(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL,  
CONTINUATION OR CIP)

As a below-named inventor, I hereby declare that:

**TYPE OF DECLARATION**

This declaration is of the following type: (check one applicable item below)

- ☒ original
- ☐ design
- ☐ supplemental

NOTE: If the declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application do not check next item; check appropriate one of last three items.

- ☐ national stage of PCT

NOTE: If one of the following 3 items apply, then complete and also attach ADDED PAGES FOR DIVISIONAL, CONTINUATION OR C-I-P.

- ☐ divisional
- ☐ continuation
- ☐ continuation-in-part (C-I-P).

**INVENTORSHIP IDENTIFICATION**

WARNING: If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

**TITLE OF INVENTION**

A HAND HELD DEVICE FOR REDUCING THE DISCOMFORT ASSOCIATED WITH THE  
ADJUSTING OF ORTHODONTIC APPLIANCES

## SPECIFICATION IDENTIFICATION

the specification of which:

(complete (a), (b) or (c))

(a) ☒ is attached hereto.

(b) ☐ was filed on \_\_\_\_\_ as

☐ Serial No. \_\_\_\_\_ or

☐ Express Mail No., as Serial No. not yet known \_\_\_\_\_  
and was amended on \_\_\_\_\_ (if applicable).

NOTE: Amendments filed after the original papers are deposited with the PTO which contain new matter are not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 CFR 1.67.

(c) ☐ was described and claimed in PCT International No. \_\_\_\_\_ filed on \_\_\_\_\_ and as amended under PCT Article 19 on \_\_\_\_\_ (if any).

## ACKNOWLEDGMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37, Code of Federal Regulations § 1.56,

(also check the following items, if desired)

☐ and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and

☐ In compliance with this duty, there is attached an information disclosure statement, in accordance with 37 CFR 1.98.

## PRIORITY CLAIM

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international applications(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

(complete (d) or (e))

- (d) ☒ no such applications have been filed.
- (e) ☐ such applications have been filed as follows.

NOTE: Where item (c) is entered above and the International Application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.

**PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS  
(6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION  
AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)-(d)**

COUNTRY (or indicate if PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 37 USC 119

**CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)  
(34 U.S.C. § 119(e))**

I hereby claim the benefit under Title 35, United States Code,  
§ 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATION NUMBER

FILING DATE

\_\_\_\_ / \_\_\_\_\_  
\_\_\_\_ / \_\_\_\_\_  
\_\_\_\_ / \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**CLAIM FOR BENEFIT OF EARLIER US/PCT APPLICATION(S)  
UNDER 35 U.S.C. 120**

- ☐ The claim for the benefit of any such applications are set forth in the attached ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN-PART (C-I-P) APPLICATION.

ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS  
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION

NOTE: If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.

POWER OF ATTORNEY

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number)

FRANK D. GILLIAM  
4565 Ruffner Street, Ste. 200  
San Diego, CA 92111

REG NO. 26,548

JOHN R. DUNCAN  
4565 Ruffner Street, Ste. 200  
San Diego, CA 92111

REG NO. 22,276

DONN K. HARMS  
4565 Ruffner Street, Ste. 200  
San Diego, CA 92111

REG NO. 38,911

(check the following item, if applicable)

☐ Attached, as part of this declaration and power of attorney, is the authorization of the above-named attorney(s) to accept and follow instructions from my representative(s).

SEND CORRESPONDENCE TO:

FRANK D. GILLIAM  
4565 Ruffner Street, Ste. 200  
San Diego, CA 92111

DIRECT TELEPHONE CALLS TO:

FRANK D. GILLIAM  
Tel (619) 292-0901  
Fax (619) 292-0905

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

SIGNATURE(S)

NOTE: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other documents.

Full name of sole or first inventor MICHAEL J. POWERS  
Inventor's signature *Michael J. Powers*  
Date July 10, 1998 Country of Citizenship The United States of America  
Residence 4711 Gabriel Way, La Mesa, California 91941  
Post Office Address 4711 Gabriel Way  
La Mesa, CA 91941

Full name of second joint inventor, if any \_\_\_\_\_  
Inventor's signature \_\_\_\_\_  
Date \_\_\_\_\_ Country of Citizenship \_\_\_\_\_  
Residence \_\_\_\_\_  
Post Office Address \_\_\_\_\_

Full name of third joint inventor, if any \_\_\_\_\_  
Inventor's signature \_\_\_\_\_  
Date \_\_\_\_\_ Country of Citizenship \_\_\_\_\_  
Residence \_\_\_\_\_  
Post Office Address \_\_\_\_\_

(check proper box(es) for any of the following added page(s)  
that form a part of this declaration)

☐ Signature for fourth and subsequent joint inventors. Number of  
pages added \_\_\_\_\_.

\* \* \*

☐ Signature by administrator(trix), executor(trix) or legal  
representative for deceased or incapacitated inventor.  
Number of pages added \_\_\_\_\_.

\* \* \*

☐ Signature for inventor who refuses to sign or cannot be reached by  
person authorized under 37 CFR 1.47.  
Number of pages added \_\_\_\_\_.

\* \* \*

- ☐ Added page for signature by one joint inventor on behalf of deceased inventor(s) where legal representative cannot be appointed in time. (37 CFR 1.47)

\* \* \*

- ☐ Added pages to combined declaration and power of attorney for divisional, continuation, or continuation-in-part (C-I-P) application.

☐ Number of pages added \_\_\_\_\_.

\* \* \*

- ☐ Authorization of attorney(s) to accept and follow instructions from representative.

If no further pages form a part of this Declaration then end this Declaration with this page and check the following item

- ☒ This declaration ends with this page